A Novel Portable Apparatus for Noninvasively Measuring Bone Density, Phase I

Completed Technology Project (2007 - 2008)

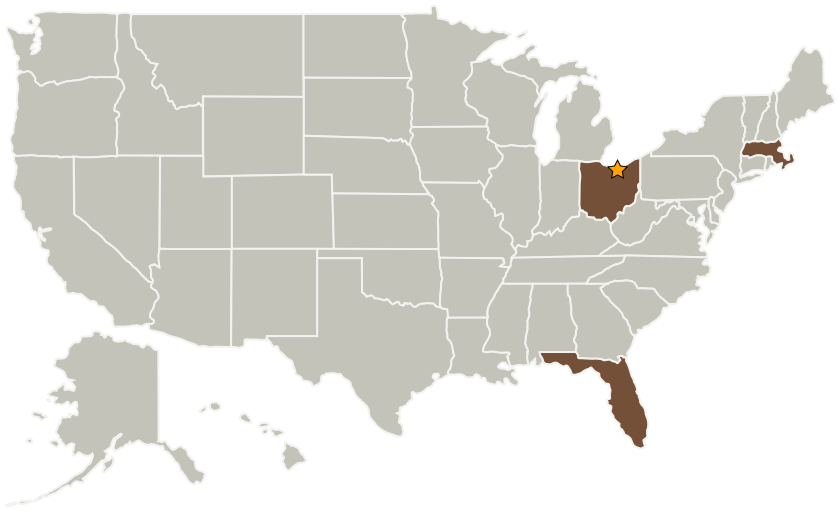
Project Introduction

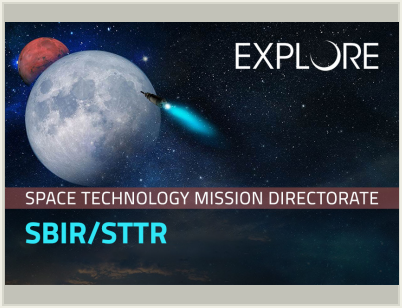
The bone loss associated with extended space missions in astronaut represents a serious health threat, both over the flight period and upon returning to gravitational fields. Continuously monitoring bone qualities during prolonged space missions will lead to a better understanding of the progressive adaptation of bone loss in astronauts subject to both microgravity and aging, and the ensuing musculoskeletal complications such as osteoporosis. In this proposal, Boston Applied Technologies Incorporated (BATi), collaborated with University of Florida, proposes a portable and noninvasive ultrasound measurement apparatus for rapid assessment of human bone densities. With our unique approach and algorithm, the proposed device will have greater measurement accuracy and sensitivity than those of other noninvasive techniques. In addition, the self-calibration feature of the instrument will assure the diagnostic methodology to be accurate, fast, and simple.

Anticipated Benefits

The potential for this apparatus in commercial clinical practice is also enormous. It can be directly used to help diagnose osteoporosis. It can also be used in common families, emergency rooms in hospitals and health clinics as a quick and fast detection tool for bone assessment.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Boston Applied Technologies, Inc.	Supporting Organization	Industry Minority-Owned Business	Woburn, Massachusetts

Primary U.S. Work Locations	
Florida	Massachusetts
Ohio	

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Project Manager:
David G Fischer

Principal Investigator:
Hongzhi Zhao

Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.4 Advanced Propulsion
    - TX01.4.3 Nuclear Thermal Propulsion